CLAIMS

I claim:

1.   A system for measuring a weight on a vehicle seat comprising:

a seat having a seat bottom;

a seat element for mounting said seat to a vehicle structure;

a seat support member for supporting said seat bottom relative to said seat element;

a sensor assembly mounted between said seat element and said seat support member and having a bending beam with a central body portion for supporting at least one strain gage for measuring strain resulting from a weight force applied to said seat bottom, said central body portion having a narrowing neck section to concentrate strain in said central body portion.

2.   A system according to claim 1 wherein said bending beam defines a first width and said neck section defines a second width that is narrower than said first width.

3.   A system according to claim 2 wherein said bending beam includes a first connecting portion for connection to said seat support member and a second connecting portion for connection to said seat element with said central body portion extending between said first and second connecting portions.

4.   A system according to claim 3 wherein said first and second connecting

portions and said central body portion form an hourglass shape.

5.   A system according to claim 3 wherein said strain gage is mounted on an exterior surface of said central body portion at said neck section.

6.   A system according to claim 3 wherein said beam includes an extension portion extending beyond one of said first or second connecting portions for supporting an electrical connector for connecting said strain gage to a processing unit.

7.   A system according to claim 6 wherein said beam defines a longitudinal axis and said extension portion includes a mount for receiving said electrical connector via a linear insertion force along said longitudinal axis.

8.   A system according to claim 1 including traces for electrically connecting said strain gage to an electronics package wherein said strain gage and said traces are screen printed on said beam.

9.   A system according to claim 1 wherein said beam is dual constrained cantilever beam.

10. A weight sensor assembly for measuring a weight on a vehicle seat comprising:

a bending beam having a first connection portion engageable with an upper seat structure and a second connection portion engageable with a lower seat structure;

a bendable central body portion extending between said first and second connection portions and having a narrowing neck portion to concentrate strain in said central body portion; and

a strain gage assembly mounted on said neck portion for measuring the strain at said central body portion resulting from a weight force being exerted against the upper seat structure.

11. An assembly according to claim 10 wherein said bending beam defines a first width and said neck section defines a second width that is narrower than said first width.

12. An assembly according to claim 11 wherein said first and second connection portions and said central body portion form an hourglass shape.

13. An assembly according to claim 12 wherein said beam includes an extension portion extending beyond one of said first or second connection portions for supporting an electrical connector to connect said strain gage to a processing unit.

14. An assembly according to claim 13 beam defines a longitudinal axis and

said extension portion includes a mount for receiving said electrical connector via a

linear insertion force along said longitudinal axis.

15. A system for measuring a weight on a vehicle seat comprising:

a seat assembly having a seat bottom;

a seat element for mounting said seat assembly to a vehicle structure;

a seat support member for supporting said seat bottom relative to said seat element;

a plurality of weight sensor assemblies each including a beam member having a first portion mounted to said seat support member, a second portion mounted to said seat element, a deflectable central body portion extending between said first and second portions, said central body portion including a narrowing neck portion to concentrate strain in said central body portion, and a strain gage assembly mounted on said beam at said neck portion for measuring the strain at said central body portion resulting from a weight force being applied to said seat bottom and wherein each of said weight sensor assemblies generates a weight signal in response to measuring the stain at said neck portion;

a processing unit for receiving said weight signals and determining the weight on said seat assembly; and

at least one safety device control module in communication with said processing unit wherein deployment of at least one safety device is controlled by said safety device control module based on the weight applied to said seat assembly.

16. A system according to claim 15 wherein said beam member defines a first width and said neck section defines a second width that is narrower than said first width.

17.   A system according to claim 16 wherein said first and second portions and said central body portion form an hourglass shape.

18.   A system according to claim 17 wherein said beam is mounted between said seat element and said seat support member in dual constrained cantilever beam configuration.

19.   A system according to claim 18 wherein said plurality of weight sensor assemblies comprises a first weight sensor assembly mounted at a first connecting point between said seat support member and said seat element, a second weight sensor assembly mounted at a second connecting point between said seat support member and said seat element, a third weight sensor assembly mounted at a third connecting point between said seat support member and said seat element, and a fourth weight sensor assembly mounted at a fourth connecting point between said seat support member and said seat element.

20.   A system according to claim 15 including traces for electrically connecting said strain gage to an electrical connector wherein said strain gage and said traces are screen printed on said beam member.